Education

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Education is the process of facilitating learning, or the acquisition of knowledge, skills, values, beliefs, and habits. Educational methods include storytelling, discussion, teaching, training, and directed research. Education frequently takes place under the guidance of educators, but learners may also educate themselves.[1] Education can take place in formal or informal settings and any experience that has a formative effect on the way one thinks, feels, or acts may be considered educational. The methodology of teaching is called pedagogy.



Lecture at the Faculty of Biomedical Engineering, CTU, in Prague

Education is commonly divided formally into such stages as preschool or kindergarten, primary school, secondary school and then college, university, or apprenticeship

A right to education has been recognized by some governments, including at the global level: Article 13 of the United Nations' 1966 International Covenant on Economic, Social and Cultural Rights recognizes a universal right to education.[2] In most regions education is compulsory up to a certain age.



School children sitting in the shade of an orchard in Bamozai, near Gardez, Paktya Province, Afghanistan



Student participants in the FIRST Robotics Competition, Washington, D.C.

Contents

Etymology

Etymologically, the word "education" is derived from the Latin *ēducātiō* ("A breeding, a bringing up, a rearing") from *ēdūcō* ("I educate, I train") which is related to the homonym *ēdūcō* ("I lead forth, I take out; I raise up, I erect") from *ē-* ("from, out of") and *dūcō* ("I lead, I conduct").[3]

History



Plato's academy, mosaic from Pompeii



Nalanda, ancient centre for higher learning

Education began in prehistory, as adults trained the young in the knowledge and skills deemed necessary in their society. In pre-literate societies this was achieved orally and through imitation. Story-telling passed knowledge, values, and skills from one generation to the next. As cultures began to extend their knowledge beyond skills that could be readily learned through imitation, formal education developed. Schools existed in Egypt at the time of the Middle Kingdom.[4]

Plato founded the Academy in Athens, the first institution of higher learning in Europe.[5] The city of Alexandria in Egypt, established in 330 BCE, became the successor to Athens as the intellectual cradle of Ancient Greece. There, the great Library of Alexandria was built in the 3rd century BCE. European civilizations suffered a collapse of literacy and organization following the fall of Rome in CE 476.[6]

In China, Confucius (551-479 BCE), of the State of Lu, was the country's most influential ancient philosopher, whose educational outlook continues to influence the societies of China and neighbours like Korea, Japan and Vietnam. Confucius gathered disciples and searched in vain for a ruler who would adopt his ideals for good governance, but his Analects were written down by followers and have continued to influence education in East Asia into the modern era.

After the Fall of Rome, the Catholic Church became the sole preserver of literate scholarship in Western Europe. The church established cathedral schools in the Early Middle Ages as centres of advanced education. Some of these establishments ultimately evolved into medieval universities and forebears of many of Europe's modern universities.[6] During the High Middle Ages, Chartres Cathedral operated the famous and influential Chartres Cathedral School. The medieval universities of Western Christendom were well-integrated across all of Western Europe, encouraged freedom of inquiry, and produced a great variety of fine scholars and natural philosophers, including Thomas Aquinas of the University of Naples, Robert Grosseteste of the University of Oxford, an early expositor of a systematic method of scientific experimentation,[7] and Saint Albert the Great, a pioneer of biological field research.[8] Founded in 1088, the University of Bologne is considered the first, and the oldest continually operating university.[9]



Matteo Ricci (left) and Xu Guangqi (right) in the Chinese edition of *Euclid's Elements* published in 1607

Elsewhere during the Middle Ages, Islamic science and mathematics flourished under the Islamic caliphate which was established across the Middle East, extending from the Iberian Peninsula in the west to the Indus in the east and to the Almoravid Dynasty and Mali Empire in the south.

The Renaissance in Europe ushered in a new age of scientific and intellectual inquiry and appreciation of ancient Greek and Roman civilizations. Around 1450, Johannes Gutenberg developed a printing press, which allowed works of literature to spread more quickly. The European Age of Empires saw European ideas of education in philosophy, religion, arts and sciences spread out across the globe. Missionaries and scholars also brought back new ideas from other civilizations — as with the Jesuit China missions who played a significant role in the transmission of knowledge, science, and culture between China and Europe, translating works from Europe like Euclid's Elements for Chinese scholars and the thoughts of Confucius for European audiences. The Enlightenment saw the emergence of a more secular educational outlook in Europe.

In most countries today, full-time education, whether at school or otherwise, is compulsory for all children up to a certain age. Due to this the proliferation of compulsory education, combined with population growth, UNESCO has calculated that in the next 30 years more people will receive formal education than in all of human history thus far.[10]

Formal education

Formal education occurs in a structured environment whose explicit purpose is teaching students. Usually, formal education takes place in a school environment with classrooms of multiple students learning together with a trained, certified teacher of the subject. Most school systems are designed around a set of values or ideals that govern all educational choices in that system. Such choices include curriculum, organizational models, design of the physical learning spaces (e.g. classrooms), student-teacher interactions, methods of assessment, class size, educational activities, and more.[11][12]

Preschool

Preschools provide education from ages approximately three to seven, depending on the country, when children enter primary education. These are also known as nursery schools and as kindergarten, except in the US, where kindergarten is a term used for primary education. Kindergarten "provide[s] a child-centred, preschool

curriculum for three- to seven-year-old children that aim[s] at unfolding the child's physical, intellectual, and moral nature with balanced emphasis on each of them."[13]

Primary


Young children in a kindergarten in Japan

Primary (or elementary) education consists of the first five to seven years of formal, structured education. In general, primary education consists of six to eight years of schooling starting at the age of five or six, although this varies between, and sometimes within, countries. Globally, around 89% of children aged six to twelve are enrolled in primary education, and this proportion is rising.[14] Under the Education For All programs driven by UNESCO, most countries have committed to achieving universal enrollment in primary education by 2015, and in many countries, it is compulsory. The division between primary and secondary education is somewhat arbitrary, but it generally occurs at about eleven or twelve years of age. Some education systems have separate middle schools, with the transition to the final stage of secondary education taking place at around the age of fourteen. Schools that provide primary education, are mostly referred to as *primary schools* or *elementary schools*. Primary schools are often subdivided into infant schools and junior school.


Primary school students with their teacher, Colombia, 2014

In India, for example, compulsory education spans over twelve years, with eight years of elementary education, five years of primary schooling and three years of upper primary schooling. Various states in the republic of India provide 12 years of compulsory school education based on a national curriculum framework designed by the National Council of Educational Research and Training.

Secondary


Students working with a teacher at Albany Senior High School, New Zealand

In most contemporary educational systems of the world, secondary education comprises the formal education that occurs during adolescence. It is characterized by transition from the typically compulsory, comprehensive primary education for minors, to the optional, selective tertiary, "postsecondary", or "higher" education (e.g. university, vocational school) for adults. Depending on the system, schools for this period, or a part of it, may be called secondary or high schools, gymnasiums, lyceums, middle schools, colleges, or vocational schools. The exact meaning of any of these terms varies from one system to another. The exact boundary between primary and secondary education also varies from country to country and even within them, but is generally around the seventh to the tenth year of schooling. Secondary education occurs mainly during the teenage years. In the United States, Canada and Australia, primary and secondary education together are sometimes referred to as K-12 education, and in New Zealand Year 1–13 is used. The purpose of secondary education can be to give common knowledge, to prepare for higher education, or to train directly in a profession.

Secondary education in the United States did not emerge until 1910, with the rise of large corporations and advancing technology in factories, which required skilled workers. In order to meet this new job demand, high schools were created, with a curriculum focused on practical job skills that would better prepare students for white collar or skilled blue collar work. This proved beneficial for both employers and employees, since the improved human capital lowered costs for the employer, while skilled employees received higher wages.



Chilean high school students during a class photograph, 2002

Secondary education has a longer history in Europe, where grammar schools or academies date from as early as the 16th century, in the form of public schools, fee-paying schools, or charitable educational foundations, which themselves date even further back.

Community colleges offer another option at this transitional stage of education. They provide nonresidential junior college courses to people living in a particular area.

Tertiary (higher)

Higher education, also called tertiary, third stage, or postsecondary education, is the non-compulsory educational level that follows the completion of a school such as a high school or secondary school. Tertiary education is normally taken to include undergraduate and postgraduate education, as well as vocational education and training. Colleges and universities mainly provide tertiary education. Collectively, these are sometimes known as tertiary institutions. Individuals who complete tertiary education generally receive certificates, diplomas, or academic degrees.



Students in a laboratory, Saint Petersburg State Polytechnical University

Higher education typically involves work towards a degree-level or foundation degree qualification. In most developed countries a high proportion of the population (up to 50%) now enter higher education at some time in their lives. Higher education is therefore very important to national economies, both as a significant industry in its own right, and as a source of trained and educated personnel for the rest of the economy.

University education includes teaching, research, and social services activities, and it includes both the undergraduate level (sometimes referred to as tertiary education) and the graduate (or postgraduate) level (sometimes referred to as graduate school). Universities are generally composed of several colleges. In the United States, universities can be private and independent like Yale University; public and state-governed like the Pennsylvania State System of Higher Education; or independent but state-funded like the University of Virginia. A number of career specific courses are now available to students through the Internet.

One type of university education is a liberal arts education, which can be defined as a "college or university curriculum aimed at imparting broad general knowledge and developing general intellectual capacities, in contrast to a professional, vocational, or technical curriculum."[15] Although what is known today as liberal arts education began in Europe,[16] the term "liberal arts college" is more commonly associated with institutions in the United States.[17]

Vocational

Vocational education is a form of education focused on direct and practical training for a specific trade or craft. Vocational education may come in the form of an apprenticeship or internship as well as institutions teaching courses such as carpentry, agriculture, engineering, medicine, architecture and the arts.



Carpentry is normally learned through apprenticeship.

Special

In the past, those who were disabled were often not eligible for public education. Children with disabilities were repeatedly denied an education by physicians or special tutors. These early physicians (people like Itard, Seguin, Howe, Gallaudet) set the foundation for special education today. They focused on individualized instruction and functional skills. In its early years, special education was only provided to people with severe disabilities, but more recently it has been opened to anyone who has experienced difficulty learning.[18]

Other educational forms

Alternative

While considered "alternative" today, most alternative systems have existed since ancient times. After the public school system was widely developed beginning in the 19th century, some parents found reasons to be discontented with the new system. Alternative education developed in part as a reaction to perceived limitations and failings of traditional education. A broad range of educational approaches emerged, including alternative schools, self learning, homeschooling and unschooling. Example alternative schools include Montessori schools, Waldorf schools (or Steiner schools), Friends schools, Sands School, Summerhill School, Walden's Path, The Peepal Grove School, Sudbury Valley School, Krishnamurti schools, and open classroom schools. Charter schools are another example of alternative education, which have in the recent years grown in numbers in the US and gained greater importance in its public education system.[19][20]

In time, some ideas from these experiments and paradigm challenges may be adopted as the norm in education, just as Friedrich Fröbel's approach to early childhood education in 19th-century Germany has been incorporated into contemporary kindergarten classrooms. Other influential writers and thinkers have included the Swiss humanitarian Johann Heinrich Pestalozzi; the American transcendentalists Amos Bronson Alcott, Ralph Waldo Emerson, and Henry David Thoreau; the founders of progressive education, John Dewey and Francis Parker; and educational pioneers such as Maria Montessori and Rudolf Steiner, and more recently John Caldwell Holt, Paul Goodman, Frederick Mayer, George Dennison and Ivan Illich.

Indigenous

Indigenous education refers to the inclusion of indigenous knowledge, models, methods, and content within formal and non-formal educational systems. Often in a post-colonial context, the growing recognition and use of indigenous education methods can be a response to the erosion and loss of indigenous knowledge and language through the processes of colonialism. Furthermore, it can enable indigenous communities to "reclaim and revalue their languages and cultures, and in so doing, improve the educational success of indigenous

students."[21]

Informal learning


Teaching indigenous knowledge, models, methods in Yanyuan County, Sichuan in China

Informal learning is one of three forms of learning defined by the Organisation for Economic Co-operation and Development (OECD). Informal learning occurs in a variety of places, such as at home, work, and through daily interactions and shared relationships among members of society. For many learners this includes language acquisition, cultural norms and manners. Informal learning for young people is an ongoing process that also occurs in a variety of places, such as out of school time, in youth programs at community centres and media labs.

Informal learning usually takes place outside educational establishments, does not follow a specified curriculum and may originate accidentally, sporadically, in association with certain occasions, from changing practical requirements. It is not necessarily planned to be pedagogically conscious, systematic and according to subjects, but rather unconsciously incidental, holistically problem-related, and related to situation management and fitness for life. It is experienced directly in its "natural" function of everyday life and is often spontaneous.

The concept of 'education through recreation' was applied to childhood development in the 19th century.[22] In the early 20th century, the concept was broadened to include young adults but the emphasis was on physical activities.[23] L.P. Jacks, also an early proponent of lifelong learning, described education through recreation: "A master in the art of living draws no sharp distinction between his work and his play, his labour and his leisure, his mind and his body, his education and his recreation. He hardly knows which is which. He simply pursues his vision of excellence through whatever he is doing and leaves others to determine whether he is working or playing. To himself he always seems to be doing both. Enough for him that he does it well."[24] Education through recreation is the opportunity to learn in a seamless fashion through all of life's activities.[25] The concept has been revived by the University of Western Ontario to teach anatomy to medical students.[25]

Self-directed learning

Autodidacticism (also autodidactism) is a contemplative, absorbing process, of "learning on your own" or "by yourself", or as a self-teacher. Some autodidacts spend a great deal of time reviewing the resources of libraries and educational websites. One may become an autodidact at nearly any point in one's life. While some may have been informed in a conventional manner in a particular field, they may choose to inform themselves in other, often unrelated areas. Notable autodidacts include Abraham Lincoln (U.S. president), Srinivasa Ramanujan (mathematician), Michael Faraday (chemist and physicist), Charles Darwin (naturalist), Thomas Alva Edison (inventor), Tadao Ando (architect), George Bernard Shaw (playwright), Frank Zappa (composer, recording engineer, film director), and Leonardo da Vinci (engineer, scientist, mathematician).

Open education and electronic technology

In 2012, the modern use of electronic educational technology (also called e-learning) had grown at 14 times the rate of traditional learning.[26] Open education is fast growing to become the dominant form of education, for many reasons such as its efficiency and results compared to traditional methods.[27] Cost of education has been an issue throughout history, and a major political issue in most countries today. Online courses often can be more expensive than face-to-face classes. Out of 182 colleges surveyed in 2009 nearly half said tuition for online courses was higher than for campus based ones.[28] Many large university institutions are now starting

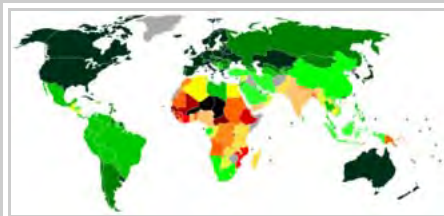
to offer free or almost free full courses such as Harvard, MIT and Berkeley teaming up to form edX. Other universities offering open education are Stanford, Princeton, Duke, Johns Hopkins, Edinburgh, U. Penn, U. Michigan, U. Virginia, U. Washington, and Caltech. It has been called the biggest change in the way we learn since the printing press.[29] Despite favourable studies on effectiveness, many people may still desire to choose traditional campus education for social and cultural reasons.[30]

The conventional merit-system degree is currently not as common in open education as it is in campus universities, although some open universities do already offer conventional degrees such as the Open University in the United Kingdom. Presently, many of the major open education sources offer their own form of certificate. Due to the popularity of open education, these new kind of academic certificates are gaining more respect and equal "academic value" to traditional degrees.[31] Many open universities are working to have the ability to offer students standardized testing and traditional degrees and credentials.[32]

A culture is beginning to form around distance learning for people who are looking to social connections enjoyed on traditional campuses. For example, students may create study groups, meetups and movements such as UnCollege.

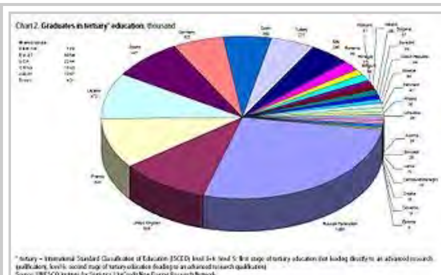
Development goals

Since 1909, the ratio of children in the developing world attending school has increased. Before then, a small minority of boys attended school. By the start of the 21st century, the majority of all children in most regions of the world attended school.



World map indicating Education Index (according to 2007/2008 Human Development Report)

Universal Primary Education is one of the eight international Millennium Development Goals, towards which progress has been made in the past decade, though barriers still remain.[33] Securing charitable funding from prospective donors is one particularly persistent problem. Researchers at the Overseas Development Institute have indicated that the main obstacles to funding for education include conflicting donor priorities, an immature aid architecture, and a lack of evidence and advocacy for the issue.[33] Additionally, Transparency International has identified corruption in the education sector as a major stumbling block to achieving Universal Primary Education in Africa.[34] Furthermore, demand in the developing world for improved educational access is not as high as foreigners have expected. Indigenous governments are reluctant to take on the ongoing costs involved. There is also economic pressure from some parents, who prefer their children to earn money in the short term rather than work towards the long-term benefits of education.



Russia has more academic graduates than any other country in Europe. (Chart does not include population statistics.)

A study conducted by the UNESCO International Institute for Educational Planning indicates that stronger capacities in educational planning and management may have an important spill-over effect on the system as a whole.[35] Sustainable capacity development requires complex interventions at the institutional, organizational and individual levels that could be based on some foundational principles:

- national leadership and ownership should be the touchstone of any intervention;

- strategies must be context relevant and context specific;
- plans should employ an integrated set of complementary interventions, though implementation may need to proceed in steps;
- partners should commit to a long-term investment in capacity development, while working towards some short-term achievements;
- outside intervention should be conditional on an impact assessment of national capacities at various levels;
- a certain percentage of students should be removed for improvisation of academics (usually practiced in schools, after 10th grade).

Internationalization

Nearly every country now has Universal Primary Education.

Similarities—in systems or even in ideas—that schools share internationally have led to an increase in international student exchanges. The European Socrates-Erasmus Program[36] facilitates exchanges across European universities. The Soros Foundation[37] provides many opportunities for students from central Asia and eastern Europe. Programs such as the International Baccalaureate have contributed to the internationalization of education. The global campus online, led by American universities, allows free access to class materials and lecture files recorded during the actual classes.

Education and technology in developing countries

Technology plays an increasingly significant role in improving access to education for people living in impoverished areas and developing countries. Charities like One Laptop per Child are dedicated to providing infrastructures through which the disadvantaged may access educational materials.


The OLPC laptop being introduced to children in Haiti

The OLPC foundation, a group out of MIT Media Lab and supported by several major corporations, has a stated mission to develop a $100 laptop for delivering educational software. The laptops were widely available as of 2008. They are sold at cost or given away based on donations.

In Africa, the New Partnership for Africa's Development (NEPAD) has launched an "e-school program" to provide all 600,000 primary and high schools with computer equipment, learning materials and internet access within 10 years.[38] An International Development Agency project called nabuur.com,[39] started with the support of former American President Bill Clinton, uses the Internet to allow co-operation by individuals on issues of social development.

India is developing technologies that will bypass land-based telephone and Internet infrastructure to deliver distance learning directly to its students. In 2004, the Indian Space Research Organisation launched EDUSAT, a communications satellite providing access to educational materials that can reach more of the country's population at a greatly reduced cost.[40]

Private vs public funding in developing countries

Research into LCPS (low cost private schools) found that over 5 years to July 2013, debate around LCPSs to achieving Education for All (EFA) objectives was polarized and finding growing coverage in international policy.[41] The polarization was due to disputes around whether the schools are affordable for the poor, reach disadvantaged groups, provide quality education, support or undermine equality, and are financially sustainable. The report examined the main challenges encountered by development organizations which support LCPSs.[41] Surveys suggest these types of schools are expanding across Africa and Asia. This success is attributed to excess demand. These surveys found concern for:

- Equity: This concern is widely found in the literature, suggesting the growth in low-cost private schooling may be exacerbating or perpetuating already existing inequalities in developing countries, between urban and rural populations, lower- and higher-income families, and between girls and boys. The report findings suggest that girls may be underrepresented and that LCPS are reaching low-income families in smaller numbers than higher-income families.
- Quality and educational outcomes: It is difficult to generalize about the quality of private schools. While most achieve better results than government counterparts, even after their social background is taken into account, some studies find the opposite. Quality in terms of levels of teacher absence, teaching activity, and pupil to teacher ratios in some countries are better in LCPSs than in government schools.
- Choice and affordability for the poor: Parents can choose private schools because of perceptions of better-quality teaching and facilities, and an English language instruction preference. Nevertheless, the concept of 'choice' does not apply in all contexts, or to all groups in society, partly because of limited affordability (which excludes most of the poorest) and other forms of exclusion, related to caste or social status.
- Cost-effectiveness and financial sustainability: There is evidence that private schools operate at low cost by keeping teacher salaries low, and their financial situation may be precarious where they are reliant on fees from low-income households.

The report showed some cases of successful voucher and subsidy programmes; evaluations of international support to the sector are not widespread.[41] Addressing regulatory ineffectiveness is a key challenge. Emerging approaches stress the importance of understanding the political economy of the market for LCPS, specifically how relationships of power and accountability between users, government, and private providers can produce better education outcomes for the poor.

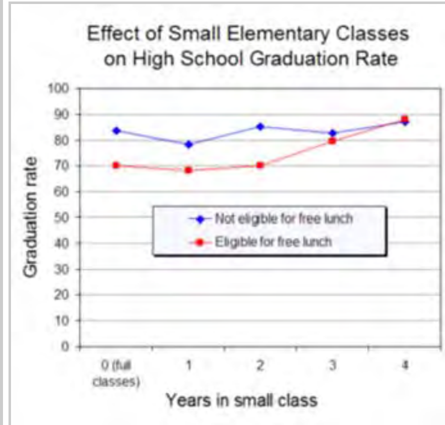
Educational theory

Educational psychology

Educational psychology is the study of how humans learn in educational settings, the effectiveness of educational interventions, the psychology of teaching, and the social psychology of schools as organizations. Although the terms "educational psychology" and "school psychology" are often used interchangeably, researchers and theorists are likely to be identified as educational psychologists, whereas practitioners in schools or school-related settings are identified as school psychologists. Educational psychology is concerned with the processes of educational attainment in the general population and in sub-populations such as gifted children and those with specific disabilities.

Educational psychology can in part be understood through its relationship with other disciplines. It is informed primarily by psychology, bearing a relationship to that discipline analogous to the relationship between medicine and biology. Educational psychology in turn informs a wide range of specialties within educational studies, including instructional design, educational technology, curriculum development, organizational

learning, special education and classroom management. Educational psychology both draws from and contributes to cognitive science and the learning sciences. In universities, departments of educational psychology are usually housed within faculties of education, possibly accounting for the lack of representation of educational psychology content in introductory psychology textbooks (Lucas, Blazek, & Raley, 2006).



A class size experiment in the United States found that attending small classes for 3 or more years in the early grades increased high school graduation rates of students from low income families.[42]

The intelligence–education relationship

Intelligence is an important factor in how the individual responds to education. Those who have higher intelligence tend to perform better at school and go on to higher levels of education.[43] This effect is also observable in the opposite direction, in that education increases measurable intelligence.[44] Studies have shown that while educational attainment is important in predicting intelligence in later life, intelligence at 53 is more closely correlated to intelligence at 8 years old than to educational attainment.[45]

Learning modalities



Knowledge Day in Donetsk, Ukraine, 2013

There has been much interest in learning modalities and styles over the last two decades. The most commonly employed learning modalities are:[46]

- Visual: learning based on observation and seeing what is being learned.
- Auditory: learning based on listening to instructions/information.
- Kinesthetic: learning based on movement, e.g. hands-on work and engaging in activities.

Other commonly employed modalities include musical, interpersonal, verbal, logical, and intrapersonal.

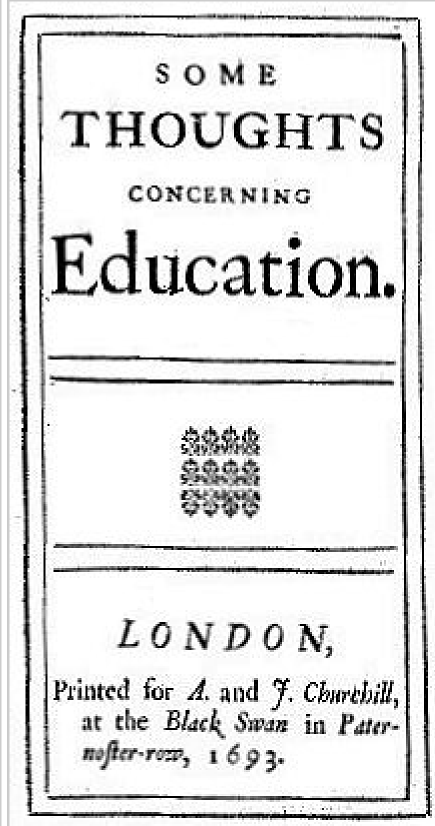
Dunn and Dunn[47] focused on identifying relevant stimuli that may influence learning and manipulating the school environment, at about the same time as Joseph Renzulli[48] recommended varying teaching strategies. Howard Gardner[49] identified a wide range of modalities in his Multiple Intelligences theories. The Myers-Briggs Type Indicator and Keirsey Temperament Sorter, based on the works of Jung,[50] focus on understanding how people's personality affects the way they interact personally, and how this affects the way individuals respond to each other within the learning environment. The work of David Kolb and Anthony Gregorc's Type Delineator[51] follows a similar but more simplified approach.

Some theories propose that all individuals benefit from a variety of learning modalities, while others suggest that individuals may have preferred learning styles, learning more easily through visual or kinesthetic experiences.[52] A consequence of the latter theory is that effective teaching should present a variety of teaching methods which cover all three learning modalities so that different students have equal opportunities to learn in a way that is effective for them.[53] Guy Claxton has questioned the extent that learning styles such as Visual, Auditory and Kinesthetic(VAK) are helpful, particularly as they can have a tendency to label children and therefore restrict learning.[54][55] Recent research has argued "there is no adequate evidence base

to justify incorporating learning styles assessments into general educational practice."[56]

Philosophy

As an academic field, philosophy of education is "the philosophical study of education and its problems (...) its central subject matter is education, and its methods are those of philosophy".[57] "The philosophy of education may be either the philosophy of the process of education or the philosophy of the discipline of education. That is, it may be part of the discipline in the sense of being concerned with the aims, forms, methods, or results of the process of educating or being educated; or it may be metadisciplinary in the sense of being concerned with the concepts, aims, and methods of the discipline."[58] As such, it is both part of the field of education and a field of applied philosophy, drawing from fields of metaphysics, epistemology, axiology and the philosophical approaches (speculative, prescriptive, and/or analytic) to address questions in and about pedagogy, education policy, and curriculum, as well as the process of learning, to name a few.[59] For example, it might study what constitutes upbringing and education, the values and norms revealed through upbringing and educational practices, the limits and legitimization of education as an academic discipline, and the relation between education theory and practice.



John Locke's work *Some Thoughts Concerning Education* was written in 1693 and still reflects traditional education priorities in the Western world.

Purpose of education

There is no broad consensus as to what education's chief aim or aims are or should be. Some authors stress its value to the individual, emphasizing its potential for positively influencing students' personal development, promoting autonomy, forming a cultural identity, and/or establishing a career or occupation. Other authors emphasize education's contributions to societal purposes, including good citizenship, shaping students into productive members of society, thereby promoting society's general economic development, and preserving cultural values.[60]

Curriculum

In formal education, a curriculum is the set of courses and their content offered at a school or university. As an idea, **curriculum** stems from the Latin word for *race course*, referring to the course of deeds and experiences through which children grow to become mature adults. A curriculum is prescriptive, and is based on a more general syllabus which merely specifies what topics must be understood and to what level to achieve a particular grade or standard.

An academic discipline is a branch of knowledge which is formally taught, either at the university–or via some other such method. Each discipline usually has several sub-disciplines or branches, and distinguishing lines are often both arbitrary and ambiguous. Examples of broad areas of academic disciplines include the natural sciences, mathematics, computer science, social sciences, humanities and applied sciences.[61]

Educational institutions may incorporate fine arts as part of K-12 grade curricula or within majors at colleges

and universities as electives. The various types of fine arts are music, dance, and theatre.[62]

Instruction

Instruction is the facilitation of another's learning. Instructors in primary and secondary institutions are often called teachers, and they direct the education of students and might draw on many subjects like reading, writing, mathematics, science and history. Instructors in post-secondary institutions might be called teachers, instructors, or professors, depending on the type of institution; and they primarily teach only their specific discipline. Studies from the United States suggest that the quality of teachers is the single most important factor affecting student performance, and that countries which score highly on international tests have multiple policies in place to ensure that the teachers they employ are as effective as possible.[63][64] With the passing of NCLB in the United States (No Child Left Behind), teachers must be highly qualified. A popular way to gauge teaching performance is to use student evaluations of teachers (SETS), but these evaluations have been criticized for being counterproductive to learning and inaccurate due to student bias.[65]

College basketball coach John Wooden the Wizard of Westwood would teach through quick "This not That" technique. He would show (a) the correct way to perform an action, (b) the incorrect way the player performed it, and again (c) the correct way to perform an action. This helped him to be a responsive teacher and fix errors on the fly. Also, less communication from him meant more time that the player could practice.[66]

Economics of education

It has been argued that high rates of education are essential for countries to be able to achieve high levels of economic growth.[67] Empirical analyses tend to support the theoretical prediction that poor countries should grow faster than rich countries because they can adopt cutting edge technologies already tried and tested by rich countries. However, technology transfer requires knowledgeable managers and engineers who are able to operate new machines or production practices borrowed from the leader in order to close the gap through imitation. Therefore, a country's ability to learn from the leader is a function of its stock of "human capital". Recent study of the determinants of aggregate economic growth have stressed the importance of fundamental economic institutions[68] and the role of cognitive skills.[69]



Students on their way to school, Hakha, Chin State, Myanmar

At the level of the individual, there is a large literature, generally related to the work of Jacob Mincer,[70] on how earnings are related to the schooling and other human capital. This work has motivated a large number of studies, but is also controversial. The chief controversies revolve around how to interpret the impact of schooling.[71][72] Some students who have indicated a high potential for learning, by testing with a high intelligence quotient, may not achieve their full academic potential, due to financial difficulties.

Economists Samuel Bowles and Herbert Gintis argued in 1976 that there was a fundamental conflict in American schooling between the egalitarian goal of democratic participation and the inequalities implied by the continued profitability of capitalist production.[73]

See also

- Alternative education
- Co-teaching
- Education for Sustainable Development
- Educational technology
- Glossary of education terms
- Human rights education
- Index of education articles
- Outline of education
- Progressive education
- Sociology of education
- Student
- School
- School uniform
- Unschooling

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